

Application No. 10/708,394
Amendment in response to
After Final Office Action mailed July 25, 2005

Docket No.: 22040-00030-US

REMARKS

Claims 1-14 remain pending in this application. Claims 1, 7, 12, and 14 are independent. Claims 1, 7, and 14 have been amended, and no claims have been added or canceled by this Amendment.

Unpatentability Rejection over Myers in View of Wilkerson

Withdrawal of the rejection of claims 1, 4-7, and 10-14 under 35 U.S.C. §103(a) as being unpatentable over Myers (US 4,817,149) in view of Wilkerson (JP 06-326555) is requested.

At the outset, Applicant notes that, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, *the prior art reference must teach or suggest all the claim limitations.*¹ Further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.²

Discussion of Myers

Myers is directed to circuits and methods for processing binaural signals, and more particularly to a method and apparatus for converting a plurality of signals having no localization information into binaural signals, and further, for providing selective shifting of the localization position of the sound.

In particular, Myers discloses an artificial, three dimensional auditory display which artificially imparts localization cues to a multifrequency component electronic signal which corresponds to a sound source. The cues imparted are a front to back cue in the form of

¹ See MPEP §2143.

² *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) and See MPEP §2143.

Application No. 10/708,394
Amendment in response to
After Final Office Action mailed July 25, 2005

Docket No.: 22040-00030-US

attenuation and boosting of certain frequency components of the signal, an elevational cue in the form of severe attenuation of a selected frequency component, *i.e.* variable notch filtering, an azimuth cue by means of splitting the signal into two signals and delaying one of them by a selected amount which is not greater than 0.67 milliseconds, an out of head localization cue by introducing delayed signals corresponding to early reflections of the original signal, an environment cue by introducing reverberations, and a depth cue by selectively amplitude scaling the primary signal and the early reflection and reverberation signals.

Myers accomplishes its stated purpose by use of an electronic switch 101 which, under the control of audio position control computer 200, selects one of filters F1 or F2. The direct sound electronic input signal applied to input terminal 110 is first processed by one of two front/back spectral biasing filters F1 or F2 as selected by electronic switch 101 under the control of the audio position control computer 200. The filters F1 and F2 have response shapes created from the spectral highlights as characterized in the disclosed algorithm (1). The filter F1 biases the sound towards the front of the listener and the filter F2 biases the sound behind the listener.

The filter F1 boosts the biasing band whose center frequencies are approximately at 392 Hz and 3605 Hz of the signal input at terminal 110, while simultaneously attenuating biasing bands whose approximate center frequencies are at 1188 Hz and 10938 Hz to impart a front cue to the signal. Conversely, by attenuating biasing bands whose approximate center frequencies are at 392 Hz and 3605 Hz while simultaneously boosting biasing bands whose approximate center frequencies are at 1188 Hz and 10938 Hz, the filter F2 imparts a rear cue to the signal.

The filters F1 and F2 are finite impulse response (FIR) filters which are digitally controllable to have any desired response characteristic and which do not introduce phase delays. Although the filters F1 and F2 are shown as separate filters selected by the switch 101, in practice, Myers discloses that there could be a single filter whose response characteristic, *i.e.* forward or backward passband cues, is changed by data downloaded from the audio position control computer 200.

Application No. 10/708,394
Amendment in response to
After Final Office Action mailed July 25, 2005

Docket No.: 22040-00030-US

Discussion of Wilkerson

As best may be determined from the uncertain machine translation from Japanese to English provided by the Examiner, Wilkerson is directed to a sub-band filtering device which reduces hardware requirements in sub-band encoding systems by providing only one half-band filter in respective low and high-band pass filters, and which places the filters in opposite stages with required symmetry.

Specific Deficiencies of Myers Combined with Wilkerson

The applied art, taken alone or in combination, does not teach or suggest a sound quality adjusting device for causing an input sound signal to pass through a plurality of FIR digital filters, controlling gains of output signals from the plurality of FIR digital filters, summing sound signals having been subjected to gain control, and outputting a sum, which includes, among other features, "...an output coupled to *both* a first output of the first FIR filter and a second output of the second FIR filter...", as recited in independent claim 1, as amended.

Further, the applied art, taken alone or in combination, does not teach or suggest an FIR filter device, which includes, among other features, "...an output coupled to *both* a first output of the first FIR filter and a second output of the second FIR filter," as recited in independent claim 7, as amended.

In addition, the applied art, taken alone or in combination, does not teach or suggest a sound quality adjusting method, which includes, among other features, "...a gain controlling step of controlling a gain of a sound signal having passed through the first FIR filter *and* a gain of a sound signal having passed through the second FIR filter; and a summing step of *summing the sound signals having undergone gain control in the gain controlling step and outputting a sum.*", as recited in unamended independent claim 12.

Finally, the applied art, taken alone or in combination, does not teach or suggest an *FIR filter designing method* for designing FIR digital filters, which includes, among other features,

Application No. 10/708,394
Amendment in response to
After Final Office Action mailed July 25, 2005

Docket No.: 22040-00030-US

"...establishing first filter coefficients having a first symmetrical sequence...changing the sequence of the first filter coefficients and determining second filter coefficients having a second symmetrical sequence...wherein the first filter coefficients and the second filter coefficients are used, respectively, as the filter factors of first and second FIR digital filters whose outputs are summed together", as recited in independent claim 14, as amended.

Clearly, Myers only uses *one* FIR filter output from either F1 or F2, *and not both at the same time*, given the switching control logic exerted in Myers by electronic switch 101 and audio position control computer 200.

Whether or not Wilkerson teaches that for which it is offered by the Examiner on page 4 of the Final Official Action, i.e., that "a sum of every other terms is equal to a sum of the other every other terms with the same signs...", Wilkerson does not make up for the above-identified deficiency of Myers with respect to each of independent claims 1, 7, 12, and 14.

Applicants submit that the clarifying amendments to claims 1, 7, and 14 to recite using outputs of *both* the first and second FIR filters do not raise any new issues or new matter, since previously presented independent claim 12 (unamended by this amendment) contains this limitation, which has previously been considered by the Examiner.

Since the applied art does not teach or suggest each claim limitation, reconsideration and allowance of claims 1, 7, 12, and 14 are respectfully requested. Further, since dependent claims 2-6, 8-11, and 13 depend from independent claims 1, 7, and 12, respectively, these claims are submitted as being allowable at least on that basis, without further recourse to the further patentable features recited therein. Allowance of dependent claims 2-6, 8-11, and 13 is also requested.

Unpatentability Rejection over Myers and Wilkerson in View of Kovtun

Withdrawal of the rejection of claims 2-3 and 8-9 under 35 U.S.C. §103(a) as being unpatentable over Myers and Wilkerson in view of Kovtun et al. (US 6,512,944) is requested. The legal requirements to establish a *prima facie* case of obviousness have been set forth above.

Application No. 10/708,394
Amendment in response to
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Docket No.: 22040-00030-US

Whether or not Kovtun discloses that for which it is offered by the Examiner, Kovtun does not make up for the previously identified deficiencies of Myers and Wilkerson with respect to independent claims 1 and 7, discussed above.

Accordingly, since the applied art does not teach or suggest each claim limitation of allowable independent claims 1 and 7 from which dependent claims 2-3 and 8-9 depend, these claims are submitted as being allowable at least on that basis, without further recourse to the further patentable features recited therein. Allowance of dependent claims 2-3 and 8-9 is requested.

Unpatentability Rejection over Myers and Wilkerson in View of Honma

Withdrawal of the rejection of claims 2-3 and 8-9 under 35 U.S.C. §103(a) as being unpatentable over Myers and Wilkerson in view of Honma (US 5,557,646) is requested. The legal requirements to establish a *prima facie* case of obviousness have been set forth above.

Whether or not Honma discloses that for which it is offered by the Examiner, Honma does not make up for the previously identified deficiencies of Myers and Wilkerson with respect to independent claims 1 and 7, discussed above.

Accordingly, since the applied art does not teach or suggest each claim limitation of allowable independent claims 1 and 7 from which dependent claims 2-3 and 8-9 depend, these claims are submitted as being allowable at least on that basis, without further recourse to the further patentable features recited therein. Allowance of dependent claims 2-3 and 8-9 is requested.

Conclusion

In view of the above amendment, applicant believes that each of pending claims 1-14 in this application is in immediate condition for allowance.

In the event the Examiner believes that an interview would be helpful in resolving any

Application No. 10/708,394
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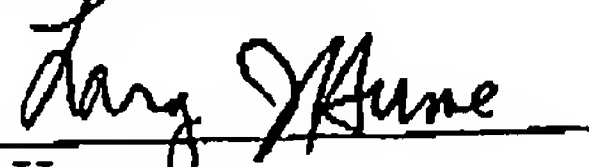
Docket No.: 22040-00030-US

outstanding issues in this case, the undersigned attorney is available at the telephone number indicated below.

For any fees that are due, including fees for filing an RCE, please charge CBLH Deposit Account No. 22-0185, under Order No. 22040-00030-US from which the undersigned is authorized to draw.

Respectfully submitted,

By


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